PATENT ABSTRACTS OF JAPAN

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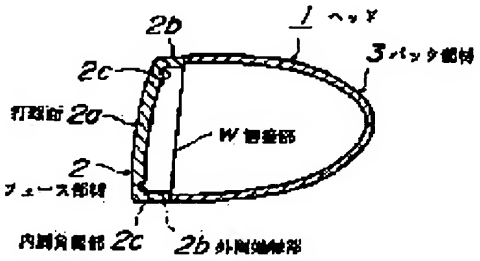
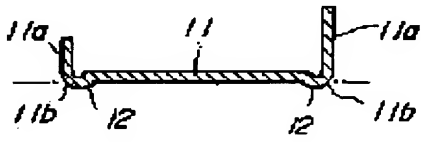
(54) MANUFACTURE OF GOLF CLUB HEAD

(57)Abstract:
PROBLEM TO BE SOLVED: To reduce manufacturing cost, easily apply elastic flexibility of a face member in hitting a ball, and improve flying distance of a ball.
SOLUTION: A head 1 is formed by a face member 2 and a back member 3 joined to the rear side of the face member 2 to back up. The face member 2 is formed to be U-shaped in section so that the outer peripheral edge part 2b of the ball hitting surface 2a is bent backward in the ball hitting direction. The inner circumferential angular edge parts 2c of the face member 2 are made thinner by bending the peripheral edge part 11a of a uniform thickness plate raw material 11 blanked to a designated shape backward in the ball hitting direction by press working, and projecting the outer peripheral angular edge part 11b forward in the ball hitting direction in the expanded state, the expanded part 12 being cut and removed to be flush with the ball hitting surface.





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* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] While the periphery edge section of a hit ball side is equipped with the face member of the cross-section KO typeface bent behind the direction of a hit ball, and the back member which backs up the rear-face side of this face member and comes to join both [these] members of each other In the process of the club head for golf which comes to carry out the thinning of the inner circumference square edge section of said face member said face member The process of the club head for golf characterized by being fabricated at the process which bends the peripheral edge edge of a thickness sheet-metal material, such as having been pierced and processed into the predetermined configuration, in press working of sheet metal back, and makes a bulge condition jut out that periphery square edge section ahead, and the process which carries out cutting removal of a part of thickness of this bulge section.
[Claim 2] The process of the club head for golf according to claim 1 characterized by coming it into a hit ball side and a flat-tapped condition to change cutting removal of the bulge section.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] About the process of the club head for golf which consists of metallic materials, such as for example, wood crab or iron crab, by improving especially to shaping of the thinning in the inner circumference square edge section of a face member, this invention gives easily the elastic bending at the time of a hit ball with cheap-ization of a manufacturing cost, and comes to plan improvement in the flight distance of a ball by this.
[0002]
[Description of the Prior Art] Conventionally, in the metalhead in this kind of crab for golf, for example, wood crab, there are some which have a configuration which was indicated to JP,60-88963,Y (this is hereafter called advanced technology) which these people applied previously and was exhibited.
[0003] Such wood crab consists of hollow outer shell structure where Head a is divided into the back member [**** / comparatively] c which backs up the rear-face side of the face member b of the comparatively thick cross-section KO typeface which the periphery edge section of a hit ball side bends back, and this face member b at plurality, and comes to join these members b and c of each other by Welding w, as shown in drawing 12 .
[0004] And by carrying out the thinning of the inner circumference square edge section, the thick face member b promotes elastic bending of the hit ball side at the time of a hit ball, raises the repulsion property over a ball, and is aiming at improvement in the flight distance of a ball.
[0005]
[Problem(s) to be Solved by the Invention] however -- although it is possible to fabricate the inner circumference square edge section of the face member b on thin meat since it is based on casting or forging shaping of rolled stock, the head a in the above-mentioned advanced technology, and if it is in fabricating the face member b especially -- casting shaping -- the face member b -- thin -- it is easy to produce fatal internal defects, such as a blow hole, in the **** square edge section, inferior to reinforcement, and is not suitable for shaping of the face member b.
[0006] And since it is necessary to make thick the square edge section of the face member b in order to secure sufficient reinforcement, it is contrary to the purpose which is going to obtain the elastic bending at the time of a hit ball.
[0007] On the other hand, there is a problem that a manufacturing cost becomes high, in shaping of the face member b by forging.
[0008] The purpose of this invention is to offer the process of the club head for golf which gives easily elastic bending of the face member at the time of a hit ball, and enabled it to aim at improvement in the flight distance of a ball with cheap-ization of a manufacturing cost.
[0009]
[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention While the periphery edge section of a hit ball side is equipped with the face member of the cross-section KO typeface bent behind the direction of a hit ball, and the back member which backs up the rear-face side of this face member and comes to join both [these]

members of each other In the process of the club head for golf which comes to carry out the thinning of the inner circumference square edge section of said face member said face member The process which bends the peripheral edge edge of a thickness sheet-metal material, such as having been pierced and processed into the predetermined configuration, in press working of sheet metal back, and makes a bulge condition jut out the periphery square edge section ahead, It is characterized by being fabricated at the process which carries out cutting removal of a part of thickness of this bulge section, and changes the cutting removal of said bulge section into said hit ball side and flat-tapped condition in this case.

[0010]

[Embodiment of the Invention] When the gestalt of implementation of this invention is hereafter explained to a detail based on the drawing shown in drawing 11 from drawing 1 R> 1, drawing 1 to drawing 7 is a thing which made wood crab the example as crab for golf concerning this invention and which shows the gestalt of the 1st operation.

[0011] As shown in drawing 4 from drawing 1 , a sign 1 is the head which has the hollow outer shell structure fabricated by the manufacturing method mentioned later, and this head 1 has the configuration which comes to join both [these] the members 2 and 3 of each other by Welding w while being divided into the face member 2 which consists of metallic materials, such as titanium, a titanium alloy, or an aluminium alloy, and the back member 3 which consists of this face member 2, congener, or a metallic material of a different kind.

[0012] Said face member 2 aims at improvement of a repulsion property to the ball by the elastic bending at the time of a hit ball by carrying out the thinning of the perigon edge 2c while periphery edge section 2b of hit ball side 2a is formed in the comparatively thick cross-section KO typeface bent behind the direction of a hit ball.

[0013] On the other hand, said back member 3 is formed in the shape of an abbreviation half ellipse ball, and has the configuration which comes to back up the rear-face side of said face member 2.

[0014] And while bending peripheral edge edge 11a of this sheet-metal material 11 in press working of sheet metal behind the direction of a hit ball first using the thickness sheet-metal material 11, such as having been pierced and processed into the predetermined configuration, (refer to drawing 5) as shown in drawing 7 from drawing 5 in order to manufacture [which is said face member 2], a bulge condition is made to jut out that periphery square edge section 11b ahead of the direction of a hit ball (refer to drawing 6).

[0015] Subsequently, by changing the cutting removal of this bulge section 12 into the front face and flat-tapped condition of the sheet-metal material 11 which serve as a hit ball side by machining (milling cutter) or polish, the thinning of the inner circumference square edge section 11c of (referring to drawing 7) and the sheet-metal material 11 is carried out, and it comes to fabricate the face member 2 as shown in drawing 4 .

[0016] In addition, in the above-mentioned gestalt of the 1st operation, although the head 1 was divided into two at the face member 2 and the back member 3, the back member 3 may be further divided, welded and joined to plurality.

[0017] Moreover, drawing 8 is the thing which made iron crab the example as crab for golf concerning this invention and which shows the gestalt of the 2nd operation. A head 1 For example, the face member 21 which consists of a metallic material with the light specific gravity of titanium, a titanium alloy, or an aluminium alloy, For example, divide into two at the back member 31 which consists of a metallic material with heavy specific gravity, such as stainless steel, copper, a copper alloy, or heavy metal, and it fabricates according to the manufacturing method which mentioned the face member 21 above. While periphery edge section 21b of hit ball side 21a forms in the cross-section KO typeface bent behind the direction of a hit ball, the thinning of the perigon edge 21c is carried out, and it has a configuration as comes to plan improvement of a repulsion property to the ball by the elastic bending at the time of a hit ball.

[0018] In this case, the centrum by which surrounding formation is carried out by the face member 21 and the back member 31 of a head 1 is filled up with fillers, such as resin or a metal, if needed, and adjustment of a center-of-gravity location or a hit ball sound is performed to it.

[0019] Furthermore, drawing 9 shows the gestalt of operation of the 3rd of the iron crab as crab

for golf concerning this invention, consists of a gestalt which comes to lay the back member 31 underground in the face member 21 of a head 1, and has the configuration which comes to form Clearance p between said face members 21 and back members 31.

[0020] Drawing 10 and drawing 11 are what shows the gestalt of the 4th and operation of the 5th of the iron crab as crab for golf concerning this invention, respectively further again. It has the configuration which comes to lay underground the back member 31 of the shape of a ring which serves as a weight member in the face member 21 of a head 1. In this case Clearance p permits bending with hit ball side 21a of the face [it is formed in the vertical and horizontal perimeter, and] member 21 at the time of a hit ball partially elastic to an upper lower edge part at least between the face member 21 and the back member 31.

[0021]

[Effect of the Invention] So that clearly from the above explanation this invention While forming by the face member of the cross-section KO typeface to which the periphery edge section of a hit ball side bends a head behind the direction of a hit ball, and the back member which backs up the rear-face side of this face member and coming to join both [these] members of each other The peripheral edge edge of a thickness sheet-metal material, such as having pierced the inner circumference square edge section of a face member in the predetermined configuration, and having been processed, is bent in press working of sheet metal behind the direction of a hit ball. Make a bulge condition jut out that periphery square edge section ahead of the direction of a hit ball, and this bulge section from coming to change thinning into a hit ball side and a flat-tapped condition by carrying out cutting removal Light-gage shaping of the inner circumference square edge section in a face member can be performed easily, and this can give easily elastic bending of the face member at the time of a hit ball.

[0022] And since the forming cycle of a face member is performed in cutting by plastic working by the press, machining, or polish, cheap-ization of a manufacturing cost can be attained.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The explanatory view which made the wood club head the example as a club head for golf concerning this invention and in which showing the gestalt of the 1st operation.
[Drawing 2] The sectional view in the A-A line of drawing 1 .
[Drawing 3] Similarly it is a decomposition perspective view.
[Drawing 4] The important section expanded sectional view of the face member in the B-B line of drawing 3 .
[Drawing 5] The sectional view showing the production process of a face member similarly.
[Drawing 6] The sectional view showing the production process of a face member similarly.
[Drawing 7] The sectional view showing the production process of a face member similarly.
[Drawing 8] The important section sectional view which made the iron club head the example as a club head for golf concerning this invention and in which showing the gestalt of the 2nd operation.
[Drawing 9] The important section sectional view which made the iron club head the example as a club head for golf concerning this invention and in which showing the gestalt of the 3rd operation.
[Drawing 10] The important section sectional view which made the iron club head the example as a club head for golf concerning this invention and in which showing the gestalt of the 4th operation.
[Drawing 11] The important section sectional view which made the iron club head the example as a club head for golf concerning this invention and in which showing the gestalt of the 5th operation.
[Drawing 12] The important section sectional view showing the conventional wood club head for golf.
[Description of Notations]
1 ... Head,
2 ... Face member,
2a ... Hit ball side,
2b ... Periphery edge section,
2c ... Inner circumference square edge section,
3 ... Buck member,
11 ... Sheet-metal material,
11a ... Peripheral edge edge,
11b ... Periphery square edge section,
11c ... Inner circumference square edge section,
12 ... Bulge section,
w ... Weld zone.

[Translation done.]

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審査請求　未請求　請求項の数２　ＯＬ　（全　４　頁）

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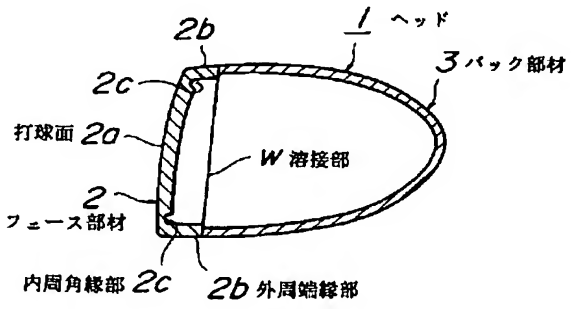
(54)【発明の名称】　ゴルフ用クラブヘッドの製法

(57)【要約】
【課題】　製造コストの低廉化と共に、打球時におけるフェース部材の弾性的な撓みを容易に付与し、ボールの飛距離の向上を図る。
【解決手段】　ヘッド１をフェース部材２と、このフェース部材２の後面側に接合されてバックアップするバック部材３とで形成する。フェース部材２を打球面２ａの外周端縁部２ｂが打球方向の後方に折曲する断面コ字形にする。フェース部材２の内周角縁部２ｃを、所定の形状に打抜き加工された等厚な板金素材１１の周端縁部１１ａを打球方向の後方にプレス加工にて折曲させて、その外周角縁部１１ｂを打球方向の前方に膨出状態に張り出させ、この膨出部１２を打球面と面一状態に切削除去することにより薄肉化する。



1

【特許請求の範囲】
【請求項１】　打球面の外周端縁部が打球方向の後方に折曲する断面コ字形のフェース部材と、このフェース部材の後面側をバックアップするバック部材とを備え、これら両部材を互いに接合してなるとともに、前記フェース部材の内周角縁部を薄肉化してなるゴルフ用クラブヘッドの製法において、
前記フェース部材は、所定の形状に打抜き加工された等厚な板金素材の周端縁部を後方にプレス加工にて折曲させ、かつその外周角縁部を前方に膨出状態に張り出させる工程と、
この膨出部の一部の厚さを切削除去する工程にて成形されることを特徴とするゴルフ用クラブヘッドの製法。
【請求項２】　膨出部を打球面と面一状態に切削除去してなることを特徴とする請求項１に記載のゴルフ用クラブヘッドの製法。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】この発明は、例えばウッドクラブあるいはアイアンクラブなどの金属材料からなるゴルフ用クラブヘッドの製法に関し、特に、フェース部材の内周角縁部における薄肉化の成形に改良を施すことにより、製造コストの低廉化と共に、打球時における弾性的な撓みを容易に付与し、これによって、ボールの飛距離の向上を図るようにしてなるものである。
【０００２】
【従来の技術】従来、この種のゴルフ用クラブ、例えばウッドクラブにおけるメタルヘッドにおいては、本出願人が先に出願し公開された実公昭６０－８８９６３号公報（以下、これを先行技術という）に開示したような構成を有するものがある。
【０００３】このようなウッドクラブは、図１２に示すように、例えばヘッドａが打球面の外周端縁部が後方に折曲する比較的肉厚な断面コ字形のフェース部材ｂと、このフェース部材ｂの後面側をバックアップする比較的肉薄なバック部材ｃとに複数に分割され、これらの部材ｂ，ｃを溶接ｗにて互いに接合してなる中空外殻構造からなっている。
【０００４】そして、肉厚なフェース部材ｂは、その内周角縁部を薄肉化することにより、打球時における打球面の弾性的な撓みを助長して、ボールに対する反発特性を高め、ボールの飛距離の向上を図っている。
【０００５】
【発明が解決しようとする課題】しかしながら、上記した先行技術におけるヘッドａ、特に、フェース部材ｂを成形するにあっては、鋳造もしくは圧延材の鍛造成形によるために、フェース部材ｂの内周角縁部を薄肉に成形することは可能であるが、鋳造成形では、フェース部材ｂの薄肉な角縁部に巣などの致命的な内部欠陥が生じ易くて強度に劣り、フェース部材ｂの成形には適さない。

2

【０００６】しかも、充分な強度を確保するには、フェース部材ｂの角縁部を肉厚にする必要があるために、打球時における弾性的な撓みを得ようとする目的に反する。
【０００７】一方、鍛造によるフェース部材ｂの成形では、製造コストが高くなるという問題がある。
【０００８】この発明の目的は、製造コストの低廉化と共に、打球時におけるフェース部材の弾性的な撓みを容易に付与し、ボールの飛距離の向上を図ることができるようにしたゴルフ用クラブヘッドの製法を提供することにある。
【０００９】
【課題を解決するための手段】上記した課題を解決するために、この発明は、打球面の外周端縁部が打球方向の後方に折曲する断面コ字形のフェース部材と、このフェース部材の後面側をバックアップするバック部材とを備え、これら両部材を互いに接合してなるとともに、前記フェース部材の内周角縁部を薄肉化してなるゴルフ用クラブヘッドの製法において、前記フェース部材は、所定の形状に打抜き加工された等厚な板金素材の周端縁部を後方にプレス加工にて折曲させ、かつその外周角縁部を前方に膨出状態に張り出させる工程と、この膨出部の一部の厚さを切削除去する工程にて成形されることを特徴とするもので、この場合、前記膨出部は、前記打球面と面一状態に切削除去される。
【００１０】
【発明の実施の形態】以下、この発明の実施の形態を図１から図１１に示す図面に基づいて詳細に説明すると、図１から図７はこの発明に係るゴルフ用クラブとしてウッドクラブを例にした第１の実施の形態を示すものである。
【００１１】図１から図４に示すように、符号１は後述する製造法により成形された中空外殻構造を有するヘッドで、このヘッド１は、例えばチタン、チタン合金あるいはアルミニウム合金などの金属材料からなるフェース部材２と、このフェース部材２と同種または異種の金属材料からなるバック部材３とに分割されているとともに、これら両部材２，３を溶接ｗにて互いに接合してなる構成を有する。
【００１２】前記フェース部材２は、打球面２ａの外周端縁部２ｂが打球方向の後方に折曲する比較的肉厚な断面コ字形に形成されているとともに、その内周角縁部２ｃを薄肉化することにより、打球時における弾性的な撓みによるボールに対する反発特性の向上を図るようになっている。
【００１３】一方、前記バック部材３は、略半楕円球状に形成されて、前記フェース部材２の後面側をバックアップしてなる構成を有する。
【００１４】そして、前記フェース部材２の製造するには、図５から図７に示すように、まず、所定の形状に打

抜き加工された等厚な板金素材１１を用い（図５参照）、この板金素材１１の周端縁部１１ａを打球方向の後方にプレス加工にて折曲させるとともに、その外周角縁部１１ｂを打球方向の前方に膨出状態に張り出させる（図６参照）。

【００１５】次いで、この膨出部１２を機械加工（フライス）または研磨等にて打球面となる板金素材１１の表面と面一状態に切削除去することにより（図７参照）、板金素材１１の内周角縁部１１ｃを薄肉化し、図４に示すようなフェース部材２を成形してなるものである。

【００１６】なお、上記した第１の実施の形態において、ヘッド１をフェース部材２とバック部材３とに２分割したが、バック部材３を更に複数に分割して溶接し接合しても良い。

【００１７】また、図８は、この発明に係るゴルフ用クラブとしてアイアンクラブを例にした第２の実施の形態を示すもので、ヘッド１を例えばチタン、チタン合金あるいはアルミニウム合金などの比重の軽い金属材料からなるフェース部材２１と、例えばステンレススチール、銅、銅合金あるいはヘビーメタルなどの比重の重い金属材料からなるバック部材３１とに２分割し、フェース部材２１を上述した製造法により成形して、打球面２１ａの外周端縁部２１ｂが打球方向の後方に折曲する断面コ字形に形成するとともに、その内周角縁部２１ｃを薄肉化し、打球時における弾性的な撓みによるボールに対する反発特性の向上を図るようにしてなる構成を有するものである。

【００１８】この場合、ヘッド１のフェース部材２１とバック部材３１とで囲繞形成される中空部には、必要に応じて樹脂あるいは金属等の充填材が充填されて、重心位置や打球音の調整が行なわれる。

【００１９】さらに、図９は、この発明に係るゴルフ用クラブとしてのアイアンクラブの第３の実施の形態を示すもので、ヘッド１のフェース部材２１内にバック部材３１を埋設してなる形態からなり、前記フェース部材２１とバック部材３１との間に隙間ｐを形成してなる構成を有する。

【００２０】さらにまた、図１０及び図１１は、この発明に係るゴルフ用クラブとしてのアイアンクラブの第４及び第５の実施の形態をそれぞれ示すもので、ヘッド１のフェース部材２１内にウエイト部材を兼ねるリング状のバック部材３１を埋設してなる構成を有し、この場合には、フェース部材２１とバック部材３１との間に隙間ｐが少なくとも上下辺部に部分的または上下左右の全周に形成され、打球時におけるフェース部材２１の打球面２１ａの弾性的な撓みを許容している。

【００２１】

【発明の効果】以上の説明から明らかなように、この発明は、ヘッドを打球面の外周端縁部が打球方向の後方に折曲する断面コ字形のフェース部材と、このフェース部材の後面側をバックアップするバック部材とで形成し、これら両部材を互いに接合してなるとともに、フェース部材の内周角縁部を、所定の形状に打抜き加工された等厚な板金素材の周端縁部を打球方向の後方にプレス加工にて折曲させて、その外周角縁部を打球方向の前方に膨出状態に張り出させ、この膨出部を打球面と面一状態に切削除去することにより薄肉化してなることから、フェース部材における内周角縁部の薄肉成形を容易に行なうことができ、これによって、打球時におけるフェース部材の弾性的な撓みを容易に付与することができる。

【００２２】しかも、フェース部材の成形工程がプレスによる塑性加工と機械加工または研磨等による切削加工にて行なわれるために、製造コストの低廉化を図ることができる。

【図面の簡単な説明】

【図１】　この発明に係るゴルフ用クラブヘッドとしてウッドクラブヘッドを例にした第１の実施の形態を示す説明図。

【図２】　図１のＡ－Ａ線における断面図。

【図３】　同じく分解斜視図。

【図４】　図３のＢ－Ｂ線におけるフェース部材の要部拡大断面図。

【図５】　同じくフェース部材の製造工程を示す断面図。

【図６】　同じくフェース部材の製造工程を示す断面図。

【図７】　同じくフェース部材の製造工程を示す断面図。

【図８】　この発明に係るゴルフ用クラブヘッドとしてアイアンクラブヘッドを例にした第２の実施の形態を示す要部断面図。

【図９】　この発明に係るゴルフ用クラブヘッドとしてアイアンクラブヘッドを例にした第３の実施の形態を示す要部断面図。

【図１０】　この発明に係るゴルフ用クラブヘッドとしてアイアンクラブヘッドを例にした第４の実施の形態を示す要部断面図。

【図１１】　この発明に係るゴルフ用クラブヘッドとしてアイアンクラブヘッドを例にした第５の実施の形態を示す要部断面図。

【図１２】　従来のゴルフ用ウッドクラブヘッドを示す要部断面図。

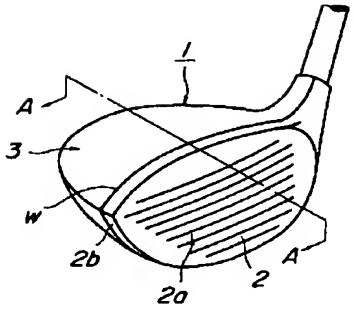
【符号の説明】

１・・・ヘッド、
２・・・フェース部材、
２ａ・・・打球面、
２ｂ・・・外周端縁部、
２ｃ・・・内周角縁部、
３・・・バック部材、
１１・・・板金素材、

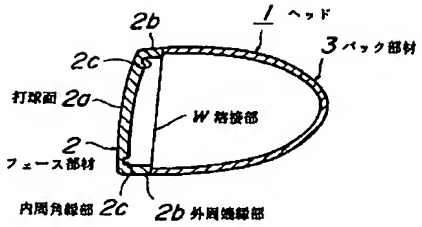
5　　6

１１ａ・・・周端縁部、
１１ｂ・・・外周角縁部、
１１ｃ・・・内周角縁部、
＊１２・・・膨出部、
ｗ・・・溶接部。
＊

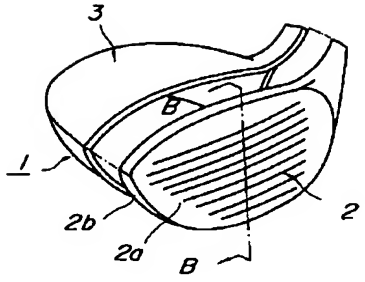
【図１】



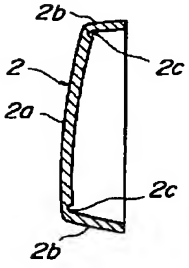
【図２】



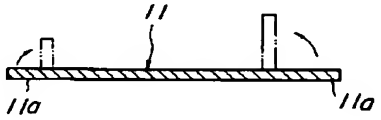
【図３】



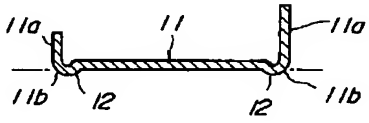
【図４】



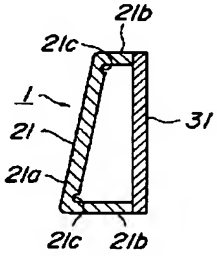
【図５】



【図６】

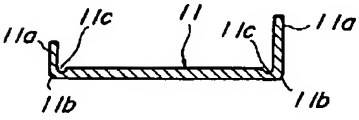


【図８】

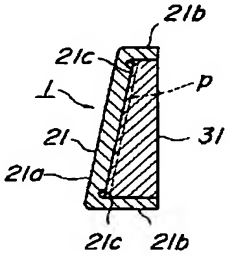


【図１０】

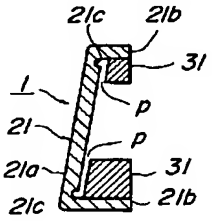
【図７】



【図９】



【図１２】



【図１１】